



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

No. IV.

TEMPORARY DIVING-BELL.

The GOLD ISIS MEDAL was presented to Capt. THOMAS DICKINSON, R.N. 13 Grove Road, St. John's Wood, for his Diving-Bell used in the Operations at Cape Frio, in 1831, for recovering the Treasure sunk in His Majesty's Frigate Thetis; a Model of which has been placed in the Society's Repository.

CAPTAIN DICKINSON attended the Committee of Mechanics on May 4th, 1842, and gave the following account of the circumstances which led to the invention of his temporary diving-bell.

On the 4th December, 1830, His Majesty's frigate Thetis, 46 guns, with a complement of 300 men, sailed from Rio de Janeiro on her voyage to England, having on board gold and silver bars, and other treasures of various descriptions, amounting in value to about 810,000 dollars, the whole being shipped on account of merchants and others in England.

At eight o'clock on the following evening the ship, having got out of her reckoning, ran on the precipitous rocks off the coast of Cape Frio, and was totally wrecked with the loss of twenty-eight of the crew. The ship, after striking, drifted into a cove of about 100 fathoms inwards from the sea, and 90 fathoms broad, and surrounded by rugged and almost perpendicular cliffs, varying from 80 to 194 feet in height, where she sank with all her treasure.

Captain Dickinson, who had at that time the command of H. M. S. Lightning, submitted to Admiral Baker, then commander-in-chief of the South American station, his plan for the recovery of the treasure; but not

being able to procure a diving-bell at Rio de Janeiro, nor the means of casting one, it occurred to him that it was possible to make such a machine of iron water-tanks, strengthened with bars of iron, &c; and he obtained the Admiral's order to be furnished with two two-ton tanks from the Warspite (flag-ship). He next had an air-pump constructed under his own directions by an English mechanic, but being unable to find a workman at Rio who would undertake to make an air-tight hose, he recollected that there was Truscott's pump on board the Lightning, and he succeeded in rendering the hoses belonging to it fit for the purpose of the air-pump by beating them hard with a broad-faced hammer, to render the texture as close as possible, then giving them a good coat of Stockholm tar, afterwards binding them with new canvass saturated with the same material, and, finally, winding them round tightly with new and well-twisted yarns. These were used throughout the whole of the operations, which lasted upwards of a year, and answered extremely well, only requiring occasional repair. A more powerful air-pump was also constructed by Captain Dickinson, by making a trifling alteration in the force-pump of Fisher's watering apparatus, which he obtained from on board the Warspite, by application to the Admiral.

The first diving-bell used in the operations was constructed in the following manner. "One side of a two-ton tank (four feet square) was taken out, another was divided into halves, from one of which halves the side was also taken out, and it was then securely joined to the bottom of the former by riveting and caulking, thus forming a cubical vessel, six feet in height, by four feet in breadth each way, and open at the bottom. Round the

upper square or head, bars of iron, two inches broad and a quarter of an inch thick, were riveted, and others were placed down each side of the corners, from the head to the lower edge, which was also strengthened in the same way as the head. In the inside, at the upper corners, were diagonal bars to afford additional support against the pressure of water when the bell was suspended. Slings, made of the Lightning's top-chain, with shackles, were attached at each corner of the head, and the other extremities were united at the point of suspension by a chain cable shackle. For the purpose of weighting the bell, three loops of bar-iron were placed on each side of the lower half, through which a sufficient quantity of chain-cable was rove, with the addition of four large pigs of ballast, one fixed in each corner, in the inside, to sink it. At eighteen inches from the lower edge in the inside, were two bars of iron, to answer the double purpose of strengthening the bell, and supporting two seats for the men to sit on; and across the centre of the bottom at the extreme lower edge, was a flat bar of iron to rest their feet on, which was removable at pleasure, to be put out of the way when the bell was at the bottom, so as not to obstruct their work. On the upper part, in the inside, were numerous hooks for the purpose of suspending the various implements for boring rocks, digging, &c. It was lighted by six patent illuminators, two on the top, and one on each side. When weighted, it weighed about four tons, but it was afterwards made considerably lighter.

This bell was worked from a davit or crane fixed in the stern of a launch, which was a service of great labour and danger, the violent surging of the boat with the top weight of the bell on the davit frequently endangering its

being swamped ; and, in order to remedy this danger, Capt. Dickinson greatly improved the bells subsequently constructed, by loading them with pigs of ballast only placed within an iron frame, and merely wedged in, so that, in the event of the wind suddenly changing, they could be easily removed, and the bell be rendered so light that it could be shifted in a few minutes, by a small tackle from the davit to the centre of the launch, the top weight being thus relieved, and the ballast made available for the boat.

While the bell was worked in this manner, the advantage of the wrought-iron material was made manifest, the bell frequently oscillating to the extent of ten or twelve feet, and it is more than probable that, under the same circumstances, a cast-iron bell would have been split, and the lives of the men lost.

In consequence of the labour and danger of towing the launch, at the close of each day's work, nearly a mile along the coast, and through a narrow strait subject to violent currents into the still water of a bay, on the beach of which the crew of the *Lightning* were encamped, Capt. Dickinson devised the construction of a derrick, of 158 feet in length, made up of twenty-two separate pieces of spars recovered from the wreck of the *Thetis*. The derrick was stepped in an excavation in the rock within the cove, a few feet above the water's edge, and supported at its head by a cable made fast to the rocks above, at the height of 150 feet, with various other stays, whereby the outer end of the derrick was raised to the height of about 40 feet above the sea. The summit of the cliff was levelled, and holes were worked in the granite wherein capstans and crabs were fixed ; the crabs having been formed out of the stumps of the topmasts saved

from the wreck. A stage was suspended from the derrick, from which a diving-bell larger than the others, but of a similar construction, was successfully worked. By all the contrivances, in which Capt. Dickinson displayed consummate professional skill and ingenuity, turning all his disposable materials to account, and meeting each difficulty as it arose, no less than $\frac{1}{8}$ ths of the treasure, and a large quantity of government stores, were recovered.

The whole account of the operations forms a most interesting narrative of patient endurance, of fatigue, sickness and hardship under difficulties so extraordinary, that they would have been deemed insuperable by any but British sailors under the direction of a most intelligent and enterprising commander.

No. V.

ELEVATING BED FOR INVALIDS.

The Thanks of the Society were presented to J. LUKE, Esq., 39 Broad Street Buildings, for his Elevating Bed for Invalids; a Model of which has been placed in the Society's Repository.

39 Broad Street Buildings,

SIR,

October 9, 1841.

ALTHOUGH several elevating beds have been contrived in some respects superior to that which I have introduced into use at the London Hospital, yet I have not seen any which in its construction is so simple, and in its cost so cheap, as that of which the accompanying is a model. I have, therefore, thought it probable that on these accounts it might be deemed worthy of a place in your museum, and with that view I beg your acceptance of it accordingly.